

Claims

What is claimed is:

1. A sealed rechargeable battery comprising:

5 a metal case having an elliptical or rectangular cross section;

a metal sealing plate for sealing an opening at one end of the case; and

an electrode plate assembly, the electrode plate assembly being housed in the case together with an electrolyte solution,

10 wherein a plurality of continuous or discontinuous projecting ridges are provided on both longer side faces of the case between a bottom face and the opening.

2. The sealed rechargeable battery according to claim 1, wherein

15 the electrode plate assembly is constituted by laminating a positive electrode plate and a negative electrode plate with a separator interposed therebetween such that a core substrate of the positive electrode plate and a core substrate of the negative electrode plate project to sides opposite to each
20 other; both end faces of the electrode plate assembly, constituted by edges of the core substrates of the positive electrode plate and the negative electrode plate, are connected to a bottom face of the case and the sealing plate; and an insulating gasket is interposed between the case and
25 the sealing plate.

3. The sealed rechargeable battery according to claim 2,
wherein

a connection flange is formed on an outer peripheral edge
of the sealing plate in an upwardly extending manner; the
5 gasket is attached so as to cover an end face and inner and
outer side faces of the connection flange; and the sealing
plate is provided in the opening of the case, and the opening
of the case is inwardly bent so as to cover the connection
flange to seal the case.

10 4. The sealed rechargeable battery according to claim 3,
wherein

each of the projecting ridges is discontinued by the
opening of the case, and a position of the sealing plate is
regulated with a projecting ridge non-formation portion.

15 5. The sealed rechargeable battery according to claim 1,
wherein

at least one connection projection is formed on the
bottom face of the case and the sealing plate.

6. The sealed rechargeable battery according to claim 1,
20 wherein

the electrode plate assembly is constituted by laminating
a positive electrode plate and a negative electrode plate with
a separator interposed therebetween such that a core substrate
of the positive electrode plate and a core substrate of the
25 negative electrode plate project to sides opposite to each

other; current collectors are connected to both end faces of the electrode plate assembly, constituted by edges of the core substrates of the positive electrode plate and the negative electrode plate; a plurality of elastic connecting pieces, 5 being pressed against the bottom face of the case so as to be in contact therewith, are provided for the current collector facing the bottom face of the case; and at least one connection projection penetrating the sealing plate through an insulating member is provided for the current collector on the 10 opening side of the case.

7. The sealed rechargeable battery according to claim 6, wherein at least one connection projection is provided on the bottom face of the case.

8. The sealed rechargeable battery according to claim 1, 15 wherein the projecting ridges are formed with such a cross section and at such intervals that allow the side faces of the case to have sufficient strength and rigidity not to cause a predetermined amount of deflection or more under influence of a predetermined internal pressure of the battery.

20 9. The sealed rechargeable battery according to claim 2 or 6, wherein

the end faces of the electrode plate assembly and the bottom face of the case and the sealing plate or the current collectors are welded to each other between the projecting 25 ridges at the positions where the projecting ridges are

provided on both side faces.

10. The sealed rechargeable battery according to claim 1, wherein

spaces are formed between both ends of the case in a
5 major axis direction of its cross section and the electrode
plate assembly, respectively.

11. A battery module including a plurality of the sealed
rechargeable batteries according to claim 5 or 7, wherein the
sealed rechargeable batteries are arranged in a row such that
10 the bottom face of the case and the sealing plate face each
other; and the connection projections provided on the bottom
face of the case and the connection projections provided on
the sealing plate or the connection projections penetrating
the sealing plate to project beyond the sealing plate are
15 welded so as to connect the sealed rechargeable batteries with
each other.

12. The battery module according to claim 11, wherein
an insulating member is provided in an outer peripheral
region of a gap between the bottom face of the case and a
20 sealed portion of the sealed rechargeable batteries connected
with each other.